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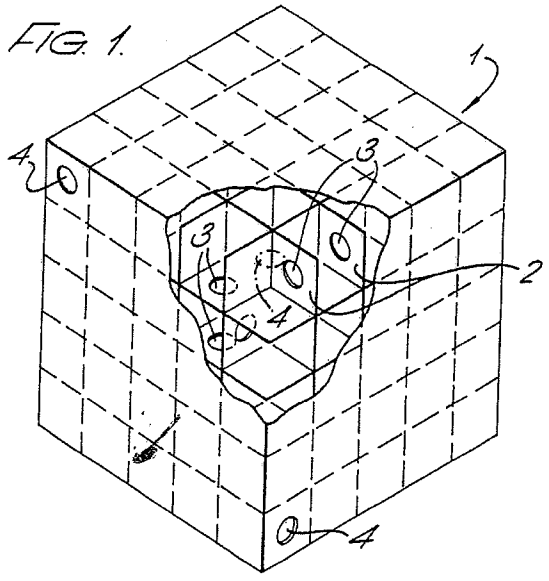
WO A1 84/00307 US 4545577 US 4494753
US 3840234 US 3700241

(58) Field of search
A6H
Selected US specifications from IPC sub-class
A63F

(54) Maze-type puzzle

(57) A toy comprises a cubical envelope (1) divided into cubical cells by internal partitions (2). Apertures (3) in the partitions provide communication between adjoining cells. The object of the game is to transfer a body such as a small ball from cell to cell within the envelope by turning and shaking the toy. Preferably apertures (4) are provided in the envelope through which balls may be introduced into peripheral "starting" cells and a central cell is designated as a "goal cell". The envelope may be made in two cooperating halves and some individual cells may contain a flat object which can hinder passage of a ball from one cell to the next.

FIG. 1.



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The drawing(s) originally filed was (were) informal and the print here reproduced is taken from a later filed formal copy.

FIG. 1.

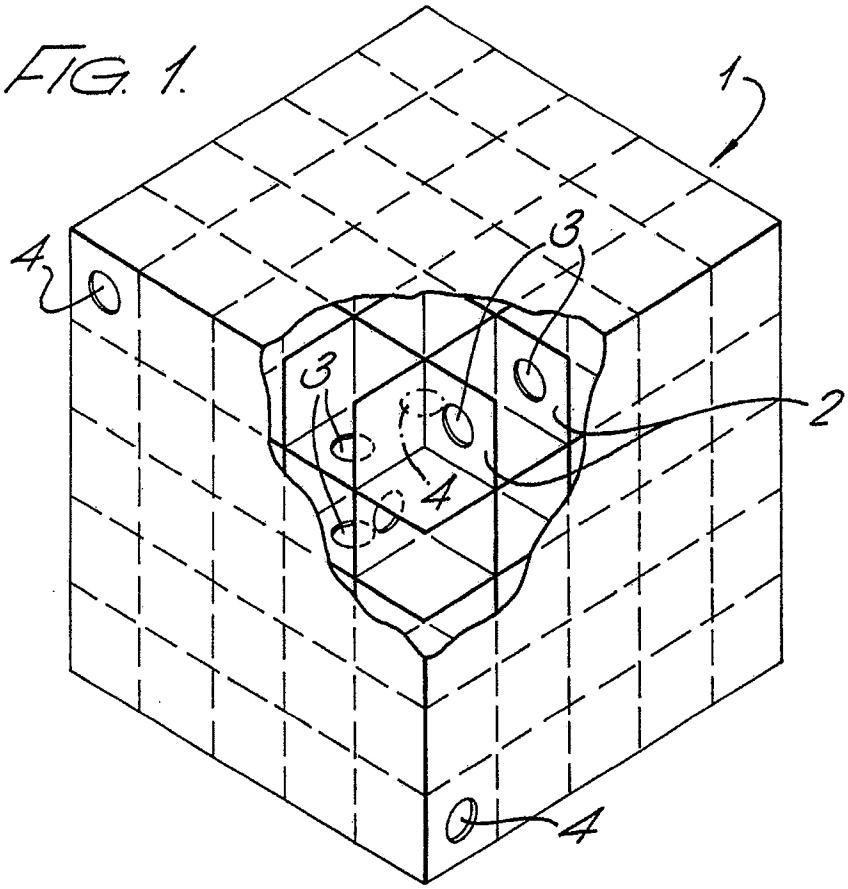


FIG. 3.

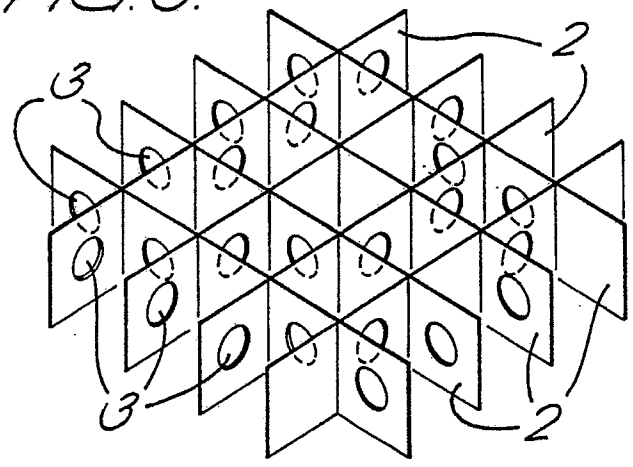


FIG. 2.

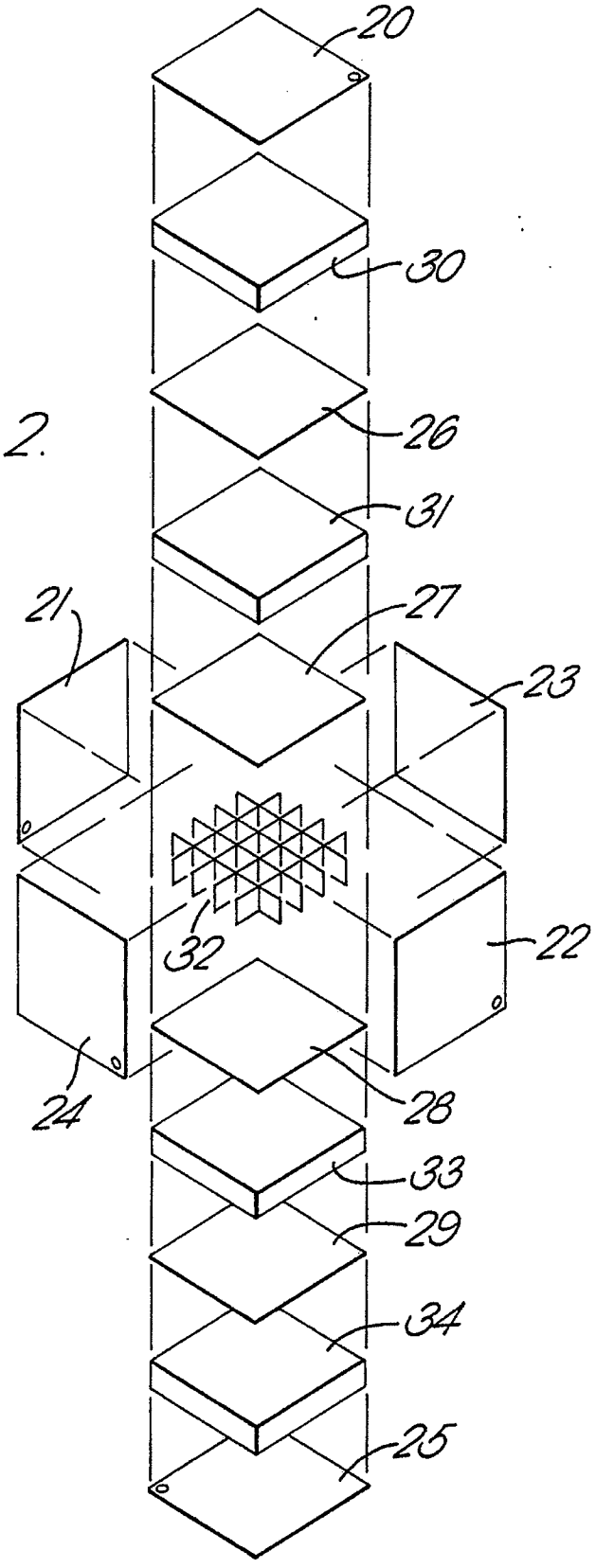


FIG. 3A.

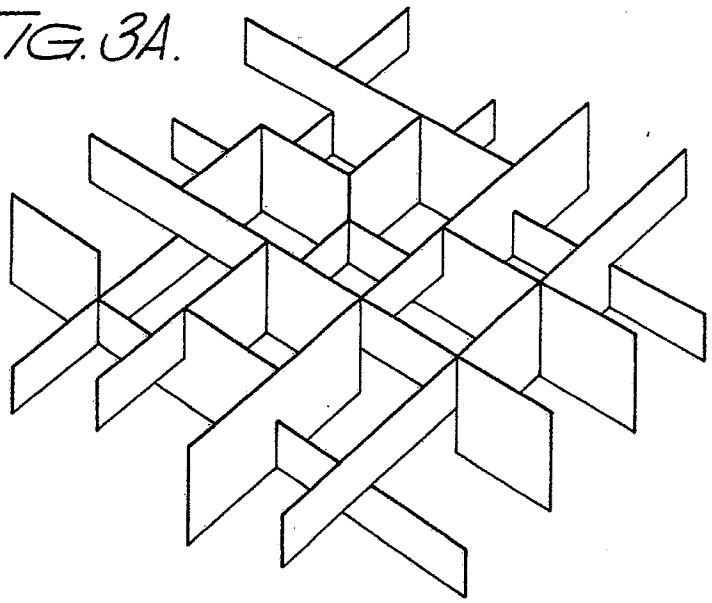


FIG. 3B.

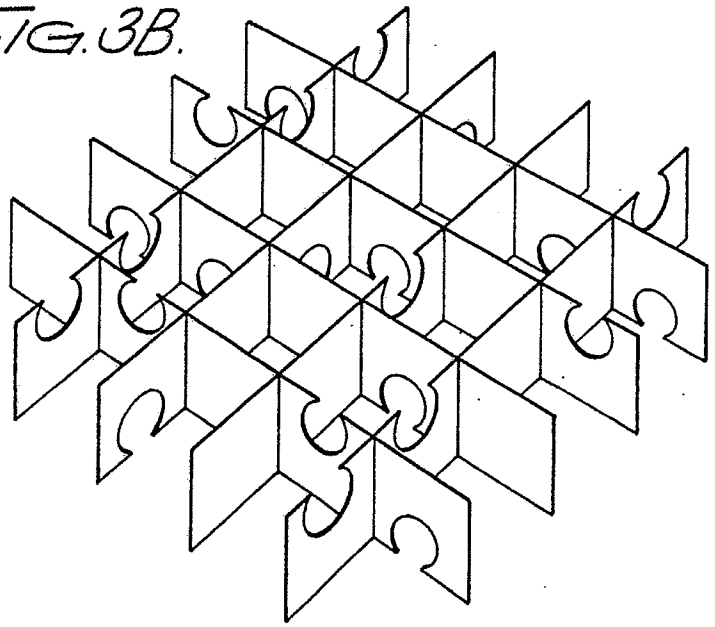
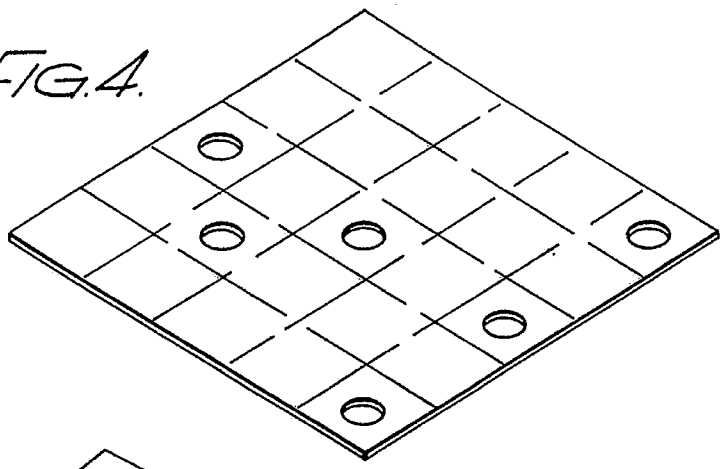


FIG.4.



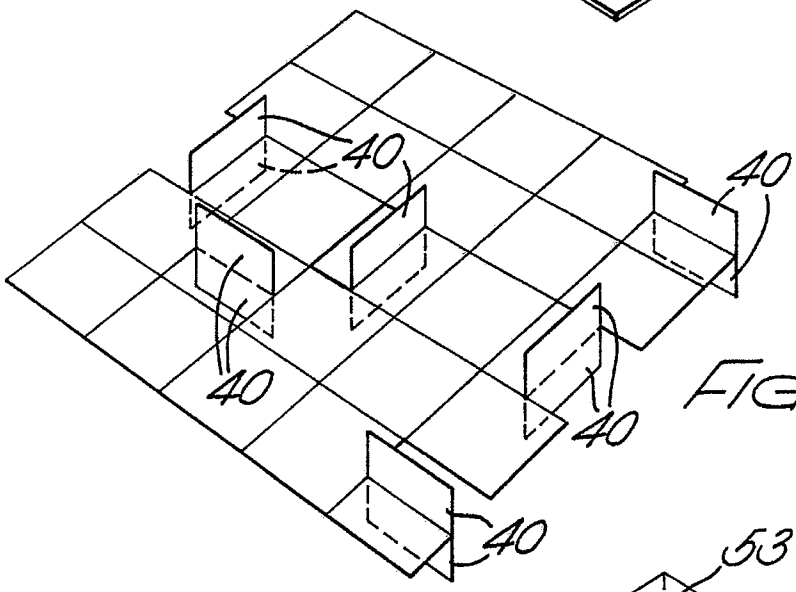


FIG.4A.

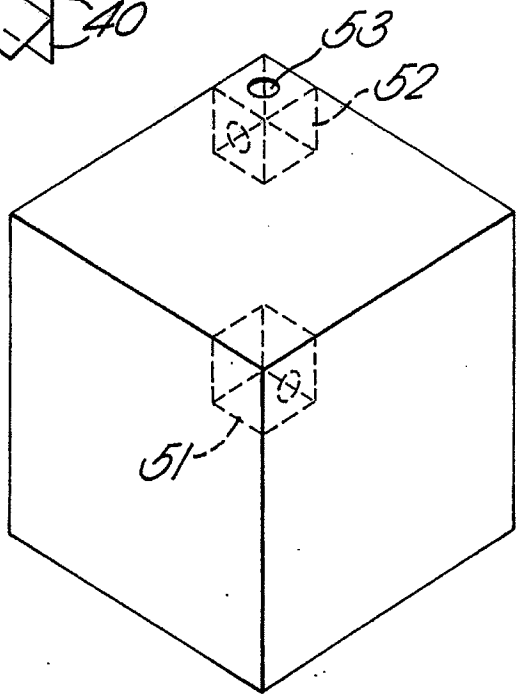


FIG.5.

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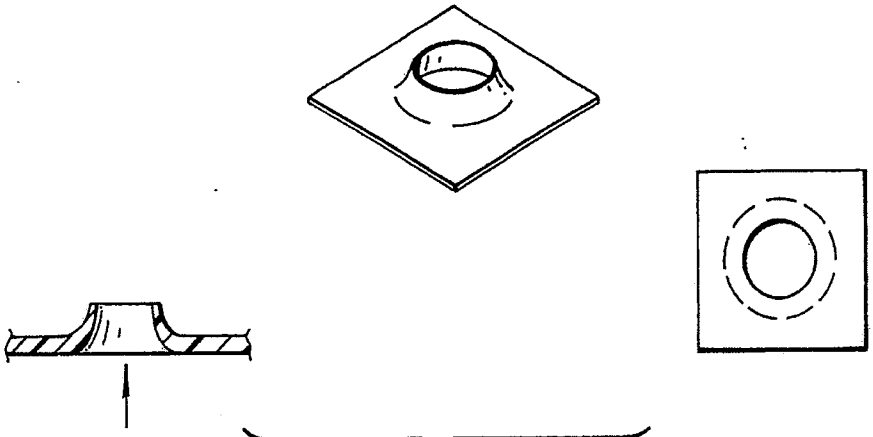

FIG. 6.

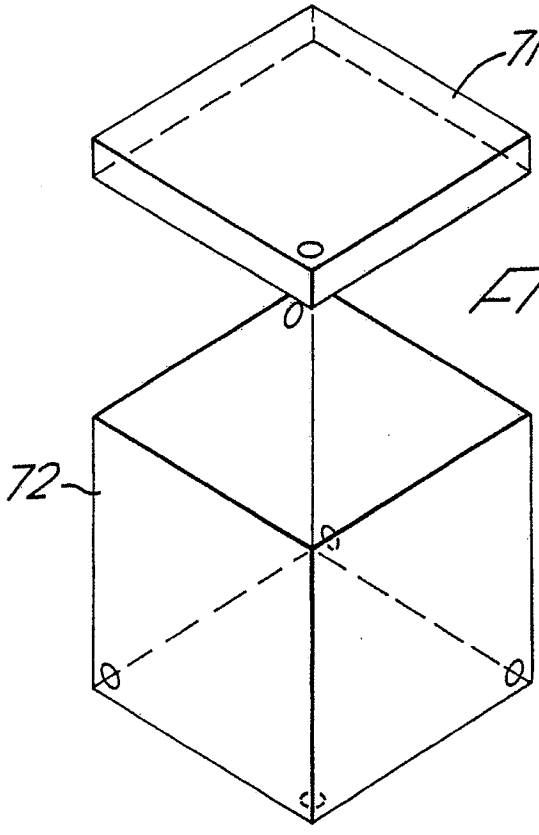

FIG. 7.

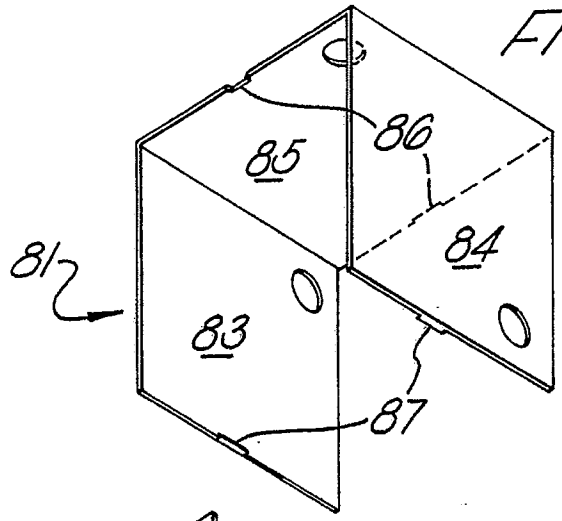

FIG. 8A.

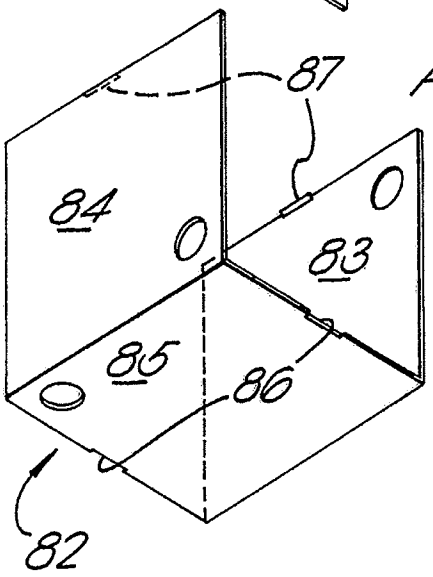

FIG. 8B.

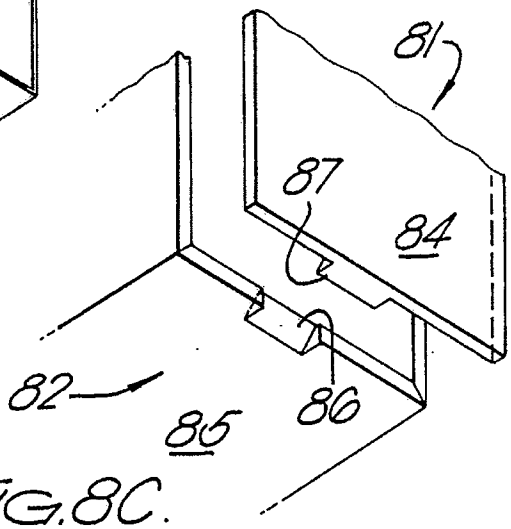

FIG. 8C.

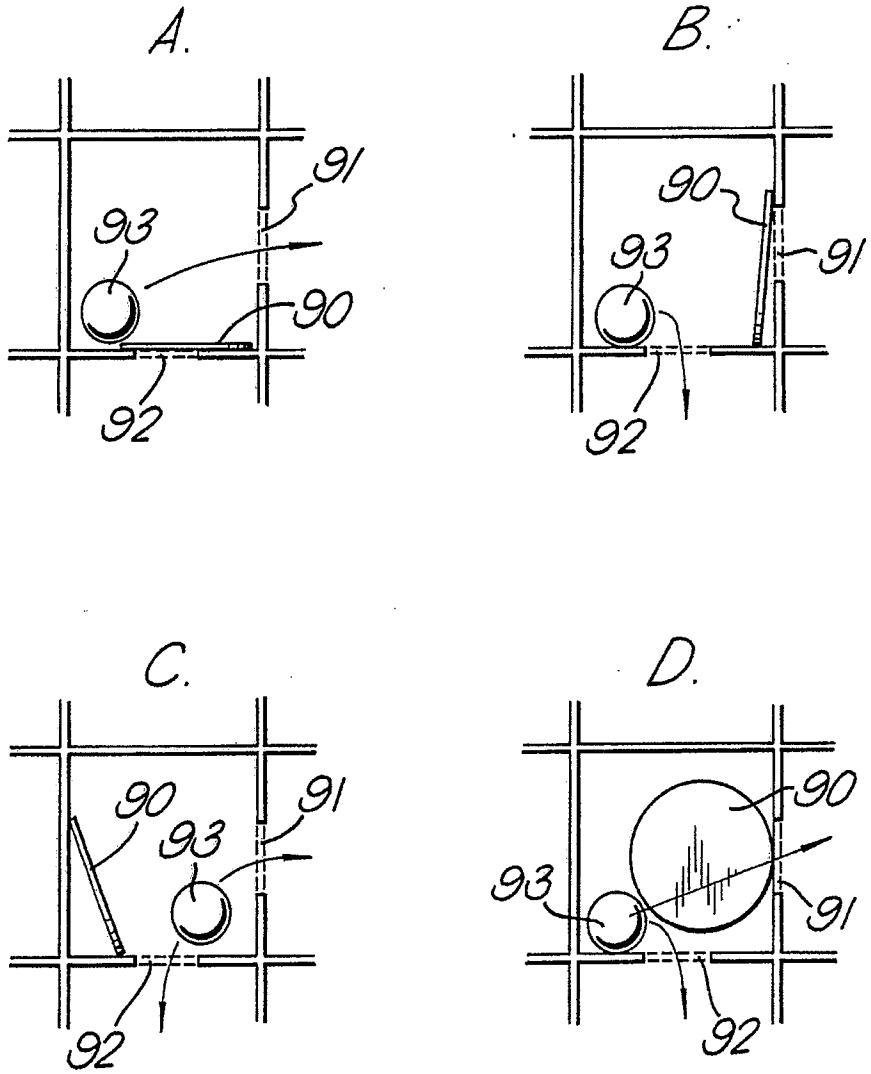

FIG. 9.

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TOY

The present invention relates to a toy which can be used for playing competitive or other games.

According to my invention I provide a toy comprising an envelope subdivided by internal partitions into an array of cells, apertures being provided in the partitions through which a body can pass through a series of cells.

The envelope is preferably but not necessarily a cube. Within the invention however other shapes, for example a cuboid, sphere, pyramid or cylinder are possible. Likewise the cells can be of any shape but this will generally be dictated by the shape of the envelope and where the latter is a cube the cells will preferably also be cubical.

The distribution of the openings will be determined by the object of the game. Generally the object of the game (as described below) will be to move a small ball, bead or other small object through successive cells with the aid of gravity by rotating (and when necessary shaking) the envelope about successive horizontal or vertical axes. Generally each cell will have inter communicating apertures with at least one and usually two of its adjacent cells. However the invention is not limited to any particular distribution, or system of distribution, of the

apertures. For satisfactory operation the expression "a series of cells" as used herein will mean at least three cells.

The game may be played by a single individual or competitively by a number of individuals. In either event it can be made an object of the game to transfer a ball, bead, or other small object from one pre-designated cell to another by successive rotations of the toy about different axes. For example, a ball can be introduced into a cell on the periphery of the toy and by successive rotation of the toy moved to a "goal cell" in the centre, or vice versa. Where the toy is used competitively several players may start balls in different cells and each by rotating the toy in turn attempt to bring his ball into the goal cell first.

In an preferred embodiment of the invention to be more particularly described hereafter the envelope is in the form of a hollow cube subdivided into a 5x5x5 array of 125 cells, apertures being formed in the walls between certain pairs of adjacent cells so as to enable a ball introduced into a cell on the periphery to be transferred by successive rotations of the cube about different axis into a central goal cell. Where, as is preferred, the cube is made of transparent plastics material the goal cell may be distinguished by a

different colour from the other cells.

According to the invention one or more "gates" may be provided inside cells. Such a gate may, for example, consist of a substantially flat object, such as a disc, of a size small enough to assume any orientation or position within a cell but large enough to block off one of the apertures in the cell and prevent the ball or other small object from passing through it. When the toy is shaken the gates inside the cells will take up different positions within the cells and add to the interest of the game.

According to a preferred mode of construction the internal array of cells is constructed or assembled separately from the envelope which consists of two co-operating halves each having a cross-piece and two side pieces, each cross piece and each side piece providing one side of the assembled toy. Each half is preferably provided on the outer edge of each side piece with locking means to engage the cross piece of the other half, whereby the envelope is removably locked around the array of cells.

The invention is not limited to strictly cubical envelopes; cuboids or other three dimensional shapes may be used and are within the scope of the invention provided that they are subdivided into adjacent

intercommunicating cells as described above. For example, a cylindrical or spherical envelope appropriately subdivided could be used.

Preferred embodiments of the invention will now be described with reference to the drawings, in which:-

Figure 1 is an isometric, partly cut away view of a toy according to the present invention.

Figure 2 is an exploded isometric view of the same toy.

Figure 3 is an isometric view, corresponding to that in Figure 2 but on a much larger scale, of one of the grids shown in Figure 2.

Figures 3A and 3B are isometric views, corresponding to that in Figure 3, of alternative forms of grid

Figure 4 is an isometric view, corresponding to that in Figure 2 but on a much larger scale, of one of the plates shown in Figure 2.

Figure 4A is an isometric view corresponding to that in Figure 4, of an alternative form of plate for use in conjunction with the grid shown in

Figure 3A.

Figure 5 is a schematic isometric view of a game corresponding to that of Figure 1 showing the "starting" and "goal" cell.

Figure 6 illustrates a preferred conformation of the openings in the partitions between the cells.

Figure 7 is an isometric view of a preferred embodiment of a toy according to the invention.

Figures 8A, B and C show in isometric view an envelope according to a preferred feature of the invention.

Figures 9A, B, C and D show a typical cell in cross-section containing a gate as hereinbefore disclosed

Referring first to Figure 1, the toy shown in this Figure consists of a cubical envelope (1) subdivided by internal partitions (2) etc into a 5x5x5 array of cubical cells. Intercommunicating openings (3) are formed in the partitions, but not every adjacent pair of cells is thus interconnected. One or more external holes (4) are provided in the external envelope whereby a ball or balls can be introduced into

a cell or cells on the periphery of the cube. By turning and shaking the cube it is possible to transfer each ball from cell to cell within the envelope via the intercommunicating openings.

A preferred mode of construction of the cube, and its internal layout, are illustrated in the exploded isometric view Figure 2. The envelope 1 (1 in Figure 1) is shown in exploded form in Figure 2 as top 20, sides 21, 22, 23, and 24 and bottom 25. The internal cells are formed by plates 26, 27, 28 and 29 alternating with grids 30, 31, 32, 33 and 34. For economy only, grid 32 is shown in full in Figure 2, the remaining grids 31-34 being identical (except for the positions of the apertures as described below) but shown in outline only and the plates 26-29 and the grids 30-34 all have appropriately placed apertures, as shown in Figures 3 and 4. Each of the external faces of the cube (20-25 inclusive) has an aperture to admit a ball or bead under the adjoining cell.

One of the grids in Figure 2 is illustrated on a larger scale in Figure 3 and consists of interlacing rectangular strips with appropriately placed apertures to interconnect the cells. The apertures may be formed in a number of ways as illustrated in Figures 3, 3A and 3B. Figure 3 shows round apertures placed centrally in the cell walls; in the grid shown in Figure 3A the

apertures are formed by constructing certain cell walls to extend part-way only between the plates, and in Figure 3B the apertures are located non-centrally in the cell walls.

One of the plates 26-29 in Figure 2 is also illustrated on a larger scale in Figure 4. An alternative form of plate is illustrated in Figure 4A; this plate has apertures in positions corresponding to the positions of the apertures in Figure 4 but formed by making the plate to extend part-way only across certain of the cell floors. Also the plate shown in Figure 4A is formed with upstanding and downwardly extending bars or fins 40.

It will readily be seen that when the game shown in exploded isometric view in Figure 2 is assembled an envelope in the form of a cube, subdivided by internal partitions into intercommunicating cells, according to the invention, is formed.

It is possible, as shown in Figure 5, to distinguish individual cells for the purposes of the game as "starting" or "goal" cells. In the example shown in Figure 5 the central cell 51 of a 5x5x5 array is designated as a goal cell and a corner cell 52 as a starting cell. The external wall of the starting cell 51 has an aperture 53 for the introduction of a ball or

bead. Where, as is preferred, the game is made from transparent plastics material the target and goal cells may be distinguished from each other and from the ordinary cells by different colouring. Further interest may be added to the game by forming some or all of the intercommunicating apertures between the cells so that it is more difficult to pass a ball through such apertures in one direction than in another. This may, for example be done by forming the aperture with a lip or flange on one side of the cell wall as illustrated in Figure 6.

Figures 8A and 8B of the drawings show in isometric view a disassembled envelope according to a preferred feature of the invention. This is in two generally identical halves, 81 and 82, which will generally be moulded of transparent or translucent plastics material. Each of the halves 81 and 82 consists of two side pieces 83 and 84 and a cross piece 85, each corresponding to a side of the assembled cube. Preferably the two halves of the envelope are provided with locking means to hold them in the assembled position around the array of cells. These locking means consist of co-operating catches formed in the outer edges of the side pieces and the sides of the centre piece of each half. Thus half 82 has formed in each of the outer edges of its centre piece an angled recess 86 which as the two halves are pushed together

engages a lug 87 in the adjacent side piece 84 of the other half 81. This arrangement is shown in enlarged isometric view in Figure 8C. It is of course possible within the scope of the invention to form the lugs in the cross-piece and the recesses in the side pieces of each half. Also the invention is not limited to the use of locking means consisting of co-operating lugs and recesses, as other locking means may readily be used

Figures 9A to 9D show in cross section a typical cell in a toy according to the invention containing a "gate" consisting of a disc 90 small enough to move freely within the cell but large enough, when in an appropriate position, to block one of the apertures 91 and 92 giving access to the cell. The position adopted by the gate within the cell will change when the toy is shaken and Figures 9A to 9D all show, by way of example only, different positions that it may take up. Thus in Figure 9A the gate has blocked aperture 92 and the ball 93 can only leave through aperture 91; in Figure 9B the gate has blocked aperture 91 and the ball 93 can only leave through aperture 92; in each of Figures 9C and 9D the gate is resting against an upright wall of the cell and blocks neither aperture, so that the ball 93 can leave through either of the apertures 91 and 92. Shaking the toy however will move the gate and change the situation.

The invention may be constructed in a number of ways which will be apparent to those skilled in the art. Although it has been shown in exploded form in Figure 2 for the sake of convenience, a practical method of construction is to form the external envelope from a cubical box with a lid as shown in Figure 7. The lid 71 may be adapted to clip or otherwise be temporarily secured onto the top of the box 72. Likewise the grids illustrated in Figures 3 3A and 3B may be formed either from separate interlocking strips or injection-moulded into a single piece. It is also possible to combine adjoining plates and grids into single injection-moulded units.

The toy may be used competively in a number of ways and the invention is not limited to any particular mode of play. The following is however given as an example.

A toy with an envelope of cubical shape according to the invention is used in which each of the six external sides of the cube has an aperture giving entry to a starting cell on the periphery of the cube and the central cell of the 5x5x5 array is designated as the goal cell. Each player is given say six balls of one colour, and each player throws a dice, the player who throws the highest number being entitled to start the game. He puts a ball into the entry hole on the top

surface of the cube, throws the dice again and is then entitled to turn the cube about whichever axis or axes he chooses, a number of times equal to the number thrown on the dice. Each further player then does the same. Throwing a six entitles a player to put in a further ball. The winner of the game is the first player one of whose balls reaches the goal cell.

CLAIMS

1. A toy comprising an envelope sub-divided by internal partitions into an array of cells, apertures being provided in the partitions through which a body can pass through a series of cells.

2. The toy of claim 1 in which the envelope is cubical.

3. A toy of claim 2 in which cells are arranged in the form of a cubical array separate from the envelope which comprises two co-operating halves each having a cross-piece and two side pieces, each cross piece and each side piece providing one side of the envelope,

4. The toy of claim 3 in which each half is provided on the outer edge of each side piece with locking means to engage the cross piece of the other half whereby the envelope can be removably locked around the array of cells.

5. The toy of claim 1, 2 or 3 in which the apertures are so disposed that a body can be transferred through a series of the said apertures from a cell adjoining the periphery of the toy to a cell in its centre.

6. The toy of any preceding claim in which the envelope comprises at least one aperture through which a body may be introduced into a cell adjoining the periphery of the toy.

7. The toy of any preceding claim in which at least one cell contains a substantially flat object small enough to assume any orientation or position in the cell but large enough to block an aperture.

8. A toy comprising:-

(i) A cubical or cuboidal envelope sub-divided by internal partitions into an array of cells.

(ii) Apertures in the partitions through which a body can pass between adjoining cells.

(iii) Apertures in the envelope through each of which a body may be introduced into a cell adjoining the periphery of the envelope from its exterior.

(iv) A goal cell in the interior of the envelope distinguished from its adjoining cells.

The apertures being so disposed as to provide indirect communication between each of the said cells on the periphery and the goal cell.

9. A toy according to any preceding claim substantially as hereinbefore described with reference to the drawings.

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